

### Abstract

The present invention relates to isolated parasitic helminth nucleic acid sequences capable of hybridizing, under stringent conditions, to at least a portion of *D. immitis* nucleic acid sequence p4 and/or to at least a portion of *D. immitis* nucleic acid sequence p22U; to isolated parasitic helminth proteins that are encoded by such parasitic helminth nucleic acid sequences and that are capable of selectively binding to at least one component of immune serum capable of inhibiting helminth development; and to antibodies raised against such isolated parasitic helminth proteins. The present invention also relates to therapeutic compositions comprising such isolated nucleic acid sequences, proteins and/or antibodies. The present invention also includes methods to produce and use such nucleic acids, proteins, antibodies and therapeutic compositions capable of protecting animals from parasitic helminth infection and, particularly, from heartworm infection.